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Preschooler's Cognitive Development in Correlation with Their Parents' Implicit Theories of Intelligence and Personality

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Abstract

This paper is devoted to cognitive development of preschoolers in correlation with implicit theories of their parents. There are four positive mindsets of intelligence and learning motivation: (1) growth intelligence mindset, (2) growth personality mindset, (3) acceptance of learning goals, (4) positive learning self-esteem. We hypothesized that cognitive and intellectual parameters and self-esteem of preschoolers correlate with parents' growth mindsets.

The study involved 120 subjects-40 preschoolers in age of 6 ± 0.5 years old (20 boys and 20 girls) and their 80 fathers and mothers. The parents ' sample consisted of subjects aged from 27 to 54 years average age was 37.9 ± 6.7 years old).

To investigate the cognitive differences of preschoolers we used: (1) two subtests of WISC (for examining attention and short-term memory); (2) Method of Verbal Thinking of Kern-Yirasek; (3) Method of Express Diagnostics of Intellectual Abilities (MEDIA) I. S. Averina, E. I. Shabanova and E. N. Zadorina. To explore parents' mindsets Questionnaire of Implicit Theories of Intelligence and Personality (by C. Dweck, in the adaptation of T.V. Kornilova et al, 2008) was used.

It was determined that the indicators of cognitive development and intelligence of girls are more related to parental attitudes than boys. In this case, the closest relationship is observed in the dyad "father – daughter". Indicators of attention, short-term memory, understanding of quantitative and qualitative relations, logical thinking are associated with mindsets of growth intelligence and adoption of their fathers' high learning value. Girls 'mathematical abilities are positively related to fathers' and negative mothers ' growth mindsets.

Keywords: parents' influence, growth intelligence mindset, growth personality mindset, learning goals, learning self-esteem, cognitive and intellectual development.

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1. Introduction

Many papers are devoted to the problems of cognitive development of preschoolers [3, 16, 21, 22]. Psychologists call family the main external factor of cognitive development. No matter how many children are in kindergarten, they live in the family. And the most important adults for children are parents. Parents, as well as teachers, form an environment favorable or unfavorable for the development of cognitive processes of the child. In this environment, there are factors such as personal qualities of parents, marital relations, parent-child relations and parents' attitudes and mindsets.

Pedagogical and parental attitudes play an important role in the child's development situation [1, 2, 6, 8, 9, 11–13, 15]. It is shown that negative child-parent relations can slow down cognitive, emotional and personal development of children [4]. A study on the impact of the psychological well-being of parents presents conflicting data [6, 14, 17, 19].

R. Sabates and Sh. Dex (2015) conducted a large-scale study devoted to the influence of parental factors on the child development. According to authors in the new millennium, there appeared such risk factors that previously had no strong influence. Based on previous studies, literature and experience, 10 factors were identified: depression of parents, illness, mother's smoking during pregnancy, addiction, family violence, financial shortage, unemployed parents, young parents, disability, large families. Risk factors affect almost all areas of child development: cognitive, emotional, behavioral, volitional, social ([18], p. 96).

F. Mensah, K. Kiernan (2010) confirm that the successful educational activity is affected by the mental disorders of the parents. Children whose parents showed a low level of mental health had lower results in key aspects of learning activities. A stronger influence was exerted by mother's mental health, at the same time, the mother's condition more influenced boys than girls ([11], p. 1024).

R. Mills-Koonce, M. Willoughby et al (2015) discovered a number of direct and indirect links between the sensitivity of mothers and fathers and the cognitive development of the child in the first 3 years ([12], p. 2). E. McCormick, Y. Qu argue that the nature of the relationship between parent and child can affect the development of those brain zones that are responsible for monitoring. Negative relationships between the child and the parent, problems in the family can inhibit the development of certain regions of the cerebral cortex. Such children can take ill-considered, spontaneous, risky decisions ([10], p. 990).

According to A. Künn-Nelen, A. Grip (2015), the indicators of the cognitive sphere are higher for those children whose mothers work part-time, or even full. In connection with these results, scientists decided to test another hypothesis that such people have a richer home environment, which is expressed in the number of child-parent activities. However, this hypothesis has not been confirmed ([8], p. 231).

Widely presented data on the importance implicit theories of intelligence and personality for the development of educational motivation and academic achievement. C. Dweck has the idea that there are two types of implicit theories of the intelligence and personality, namely, the theory of growth and fixed mindsets. Numerous researches of C. Dweck and her followers show that the growth mindset significantly influences on educational motivation. At the same time, there is a lack of data about parents' mindsets affects on the cognitive abilities of the child and his intellectual development.

This issue is especially important in the situation of preschool preparation and adaptation to the school. We assumed that the cognitive characteristics of the child of 6 years old and the indices of his intellect are significantly related to the parents' mindsets toward the development of the intellect and personality, as well as the availability of the value of learning and the acceptance of its goals by the parents.

2. Methodology

The study involved 120 participants: 40 children in age of 6 ± 0.5 years old and their 20 fathers and 20 mothers. The study involved only complete families to exclude the emergence of additional factors. The children's sample is balanced by gender: 50% of boys and 50% of girls. The age of parents is 27 to 54 years (37.9 ± 6.7). The sampling took place on the basis of psychological centers and kindergartens.

To investigate the cognitive differences of preschoolers we used:

1. Two subtests of Wechsler Intelligence Scale for Children (WISC) (for examining attention and short-term memory);
2. Method of Verbal Thinking of Kern-Yirasek;
3. Method of Express Diagnostics of Intellectual Abilities (MEDIA) I. S. Averina, E. I. Shabanova and E. N. Zadorina.

The study of preschool children was carried out individually.

Both parents were asked to fill in the Questionnaire of Implicit Theories of Intelligence and Personality (by C. Dweck, in the adaptation of T.V. Kornilova et al, 2008).

The Questionnaire is aimed at diagnosing everyday ideas about the possibilities of developing intelligence and personal growth in the learning process. In addition, the Questionnaire allows to evaluate such parameters as "Self-assessment of Learning" (self-presentation of intellectual success) and "Learning Goals" (mastery orientation). The statements of these scales were slightly modified taking into account the sample of the study (parents).

Mathematical data processing was carried out with nonparametric statistics (Spearman correlation analysis (r_s), Wilcoxon test for comparing two dependent sample (T).

3. Results

Mothers are more than fathers focused on personal growth (Tamp = 115.5, p = 0.02). Fathers are more focused on the development of mastery and the adoption of learning goals (Tamp = 72.5, p = 0.00) (Table 1). Mothers adhere more to the view that genetics and an innate factor are less important than education for the development of the child's cognitive sphere. The fathers pay more attention to the development of skill and the ability to set and achieve educational and professional goals.

Table 1: Differences in pairs between father and mother in growth and learning mindsets.

	Fathers, Mean	Mothers, Mean	T	p
Mindset of Growth Intelligence	1,81	1,63	182,00	0,87
Mindset of Growth Personality	**2,16**	**3,05**	**115,50**	**0,02**
Learning Goals	**3,88**	**1,88**	**72,50**	**0,00**
Learning Self-esteem	5,59	4,63	135,00	0,46

Table 2 presents data on the relationship between mothers' implicit theories of growth intelligence and personality with cognitive parameters of their children, as well as their self-esteem (the Spearman correlation coefficient was used).

From the data presented in Table 2, it is evident that children whose mothers adhere to the theory of growth intelligence, have significantly higher scores of Vocabulary subtest (r_s = 0.33; $p \leq 0.05$). The correlation analysis separately for girls and boys showed that this result was manifest mainly by girls (r_s = 0.54, $p \leq 0.05$). In boys, only the vocabulary indicators are related to the fact that their mothers adhere to the theory of growth personality (r_s = 0.49; $p \leq 0.05$). It is noteworthy that it is for girls that their cognitive indices are related to the positive mindsets of their mothers. Thus, mothers' growth intelligence mindset is associated with high rates of logical thinking (r_s = 0.47;

Table 2: Correlation between mothers' growth mindsets (GM) and cognitive parameters of their 6 – 7 year children (n).

	Mother (40) – Child (40)		Mother (20) – Son (20)		Mother (20) – Daughter (20)	
	GM of Intelligence	GM of Personality	GM of Intelligence	GM of Personality	GM of Intelligence	GM of Personality
Attention (WISC's Subtest)	0.11	-0.20	0.18	-0.24	0.19	0.38
Short-term memory (WISC's Subtest)	0.31	-0.05	0.40	-0.10	0.22	**0.70*** **
Verbal Thinking (Kern – Jirasek Subtest)	0.18	-0.17	-0.04	0.00	0.20	0.26
Vocabulary (MEDIA's Subtest)	**0.33***	0.27	0.15	**0.49***	**0.54***	0.06
Quantitative and Qualitative ratio (MEDIA's Subtest)	-0.07	-0.28	0.41	0.07	0.15	-0.22
Logical Thinking (MEDIA)	0.06	-0.20	-0.26	0.06	**0.47***	-0.10
Math abilities (MEDIA)	0.03	-0.15	0.17	-0.33	**-0.53***	0.41
General Indicator (MEDIA)	0.13	-0.23	0.26	0.03	0.13	0.16
Self-esteem	-0.03	-0.15	0.19	-0.14	**0.50***	0.06

$p \leq 0.05$), vocabulary ($r_s = 0.54$; $p \leq 0.05$), as well as with high self-esteem of thier daughters ($r_s = 0.50$; $p \leq 0.05$). The indicator of short-term memory of girls is related to the fact that their mothers adhere to the everyday theory of growth personality ($r_s = 0.70$, $p \leq 0.001$).

Cognitive characteristics and intelligence of boys are not related to the fathers' implicit theories of growth intelligence and personality. Some features are defined for girls: the indicator of their mathematical abilities is related to the presence of an implicit theory of growth intelligence in their fathers ($r_s = 0.64$, $p \leq 0.01$). Indicators of short-term memory of girls are also related to the fact that their fathers adhere to implicit theory of increasing intelligence ($r_s = 0.50$; $p \leq 0.05$) and personal growth ($r_s = 0.46$; $p \leq 0.05$).

Short-term memory and vocabulary of children associated with their mothers' positive attitudes to own learning process. Short-term memory of daughters correlates with orientation of their mothers to mastery ($rs = 0.47$; $p \leq 0.05$) and high self-esteem of their own learning ($rs = 0.51$; $p \leq 0.05$). Vocabulary and verbal reasoning are related to tendency of their mother to appreciate her own learning abilities ($p \leq 0.05$).

Table 3: Correlation between fathers' growth mindsets (GM) and cognitive parameters of their 6 – 7 year children (n).

	Father (40) – Child (40)		Father (20) – Son (20)		Father (20) – Daughter (20)	
	GM of Intelligence	GM of Personality	GM of Intelligence	GM of Personality	GM of Intelligence	GM of Personality
Attention (WISC's Subtest)	0.15	-0.11	0.14	-0.04	0.28	-0.04
Short-term memory (WISC's Subtest)	0.32	0.09	0.04	-0.25	**0.50***	**0.46***
Verbal Thinking (Kern – Jirasek Subtest)	-0.04	-0.09	-0.39	-0.18	0.07	-0.06
Vocabulary (MEDIA's Subtest)	-0.06	-0.04	0.21	0.42	-0.17	-0.22
Quantitative and Qualitative ratio (MEDIA's Subtest)	-0.04	-0.27	-0.08	-0.30	-0.13	-0.29
Logical Thinking (MEDIA)	-0.17	-0.28	-0.08	-0.07	-0.21	-0.43
Math abilities (MEDIA)	0.26	0.01	-0.15	-0.47	**0.64****	0.43
General Indicator (MEDIA)	0.06	-0.24	-0.12	-0.37	0.17	-0.11
Self-esteem	-0.14	-0.12	0.22	0.03	-0.31	-0.25

Some cognitive parameters of girls are related to their fathers' positive attitude to adoption of learning goals and skills. Namely, this is the level of attention (r_s = 0.73; $p \leq 0.001$), short-term memory (r_s = 0.54; $p \leq 0.05$), the parameter for estimating qualitative and quantitative ratios (r_s = 0.48; $p \leq 0.05$); logical thinking (r_s = 0.68; $p \leq 0.01$) and the general indicator of intellectual development (r_s = 0.62, $p \leq 0.01$). The logical thinking of daughters is reliably associated with the father's tendency to appreciate his own educational and mental abilities (r_s = 0.56; $p \leq 0.01$).

4. Conclusion

The hypothesis of the relationship between the cognitive abilities of children and their parents' implicit theories of growth has been partially confirmed. There are features of the relationship between implicit theories of growth intelligence and personality with cognitive functions of boys and girls. Mothers' and fathers' everyday theories affect children in different ways. It is determined that the cognitive development of

Table 4: Correlation between mothers' learning mindsets (LM) and cognitive parameters of their 6 – 7 year children (n).

	Mother (40) – Child (40)		Mother (20) – Son (20)		Mother (20) – Daughter (20)	
	Learning Goals	Learning self-esteem	Learning Goals	Learning self-esteem	Learning Goals	Learning self-esteem
Attention (WISC's Subtest)	-0.15	-0.12	-0.01	-0.23	-0.41	0.01
Short-term memory (WISC's Subtest)	**0.42****	**0.36***	0.25	0.37	**0.47***	**0.51***
Verbal Thinking (Kern – Jirasek Subtest)	0.24	-0.19	-0.24	**0.45***	-0.13	-0.02
Vocabulary (MEDIA's Subtest)	**0.36***	**0.35***	0.32	**0.46***	-0.01	0.36
Quantitative and Qualitative ratio (MEDIA's Subtest)	0.24	-0.14	-0.24	0.29	-0.24	0.24
Logical Thinking (MEDIA)	0.22	-0.22	-0.12	0.14	-0.37	0.21
Math abilities (MEDIA)	0.02	0.08	-0.36	-0.05	-0.01	0.12
General Indicator (MEDIA)	0.29	-0.08	-0.24	0.23	-0.23	0.38
Self-esteem	-0.25	-0.20	-0.06	-0.22	-0.10	-0.18

Table 5: Correlation between fathers' learning mindsets (LM) and cognitive parameters of their 6 – 7 year children (n).

	Father (40) – Child (40)		Father (20) – Son (20)		Father (20) – Daughter (20)	
	Learning Goals	Learning self-esteem	Learning Goals	Learning self-esteem	Learning Goals	Learning self-esteem
Attention (WISC's Subtest)	0.19	0.23	-0.04	0.26	**0.73*****	0.34
Short-term memory (WISC's Subtest)	0.13	0.18	-0.27	0.15	**0.54***	0.27
Verbal Thinking (Kern – Jirasek Subtest)	-0.01	0.11	-0.50	0.03	0.22	0.18
Vocabulary (MEDIA's Subtest)	0.22	0.16	-0.10	0.33	0.38	0.23
Quantitative and Qualitative ratio (MEDIA's Subtest)	**0.41****	0.23	0.20	0.19	**0.48***	0.38
Logical Thinking (MEDIA)	0.01	0.21	-0.47	-0.04	**0.68****	**0.56****
Math abilities (MEDIA)	-0.22	-0.05	-0.38	0.00	0.15	-0.08
General Indicator (MEDIA)	0.13	0.17	-0.41	0.04	**0.62****	0.38
Self-esteem	0.16	-0.05	0.19	0.01	0.28	-0.14

children is more closely connected with the mother's attitudes to the development of intelligence and the acceptance of the value of learning.

A significant correlation is defined between mothers' mindsets of growth intelligence personality with the verbal development of the child, especially with vocabulary. It is possible that the mother's attitude to development promotes more frequent communication between mother and child, discussion of various topics, negotiation of certain problems, which not only contributes to development of cognitive sphere, but also to enrichment of the child's vocabulary. Motherly attitudes influences on both sons and daughters. Nevertheless, the daughters are more: in mothers with positive attitudes toward the development of intelligence and personality, daughters demonstrate high rates of short-term memory, logical thinking, they have a good vocabulary and high self-esteem.

It is noteworthy that the relationship between self - esteem and parental attitudes is typical only for the «mother-daughter» dyad. Paternal attitudes have no influence on the cognitive development of children and are associated only with the cognitive performance of daughters. Girls 'mathematical abilities positively correlated with attitudes towards fathers 'and mothers' development.

Recognition of learning goals and high assessment of its role in life by parents also affect to cognitive development of children 6 years. Short-term memory and vocabulary are associated with positive attitudes towards mother's education, while the ability to correctly determine quantitative and qualitative relationships is associated with father's attitudes. At the same time, the closest relationship between positive attitudes to learning and cognitive development of the child is observed in the «father – daughter» dyad. The father's mindsets influence on development of attention, short-term memory of the daughter, as well as logical thinking, the ability to find the right qualitative and quantitative ratios. The overall high level of intellectual development of girls is linked to positive attitudes towards the learning of their fathers. At the same time, cognitive and intellectual indicators of boys do not reveal such a correlation with their fathers' attitudes.

The data obtained are of a pilot nature and require further clarification. We plan to conduct a larger-scale study. Exploration parental attitudes in connection with cognitive development of their children is important in pedagogical psychology, and also contributes to the understanding of the importance of parents ' mindsets for educational, academic and professional activities of their child in future.

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